# Does experience doing lumbar punctures result in expertise?

## A medical maxim bites the dust

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It is a long held maxim by neurologists and non-neurologists alike that if you want a lumbar puncture performed, call in the neurologist. In a training institution, when a board-certified neurologist is not available, call the neurology resident. With 10, 50, maybe even 100 spinal taps under his or her belt, a neurology resident should certainly know how to perform the procedure and get the job done. In fact, that is what we have been led to believe; a lot of experience means a lot of expertise with any procedure. That was, until this belief started being tested.[1] And so, another medical maxim bites the dust.

In this issue of *Neurology*®, Barsuk and colleagues[2] from the Northwestern University Feinberg School of Medicine compared the skill at performing lumbar punctures by neurology residents (mean of 25 LPs performed) to simulator-trained internal medicine interns (mean LPs = 1). After the simulator training, the PGY1 internal medicine trainees performed better on a standardized evaluation of their skills than the PGY2–4 neurology trainees with "years" of experience.

This is an interesting result, one that could be entirely expected by those following the simulator training literature. Simulators have been used to train fourth-year medical students, with no previous suturing experience, to perform laparoscopic suturing and to successfully tie a free-hand laparoscopic knot. Results were compared to those of senior-level surgery residents performing the same task. The results between the 2 groups were similar.[3] In another study, surgery residents trained with a simulator were more comfortable with actually performing laparoscopic surgery in the operating room.[4] From thoracocentesis to central line placement, trainees in internal medicine have been taught common bedside procedures using simulation training and this intensive teaching technique leads to better cognitive and procedural knowledge on postsimulation testing.[5]

So should we abandon the concept that experience with real, live people is important in the training of our residents? Of course not. Although the Barsuk et al. study suggests simulator training is superior to live patient experience, it does have weaknesses. The authors contend that the medicine interns did better at performing the LP technique than the neurology residents based on observation of both groups' performance on a simulator and with the observer citing a checklist of appropriate steps. It is not clear whether this checklist has been validated, though few would argue as to the importance of many of the steps. While all steps listed on the checklist are important in the preparation and performance of an LP, some are more difficult for a neurology resident, with human experience, to entertain on a model simulator. Items such as "obtain informed consent" and "calling a time out" may be difficult to remember to do on a mannequin for those with exclusive live patient experience. Others items, such as demonstrating "knowledge of anatomic location" and "setting up equipment" (all of which the Medicine interns did statistically more frequently) are deficiencies that clearly need correction before neurology trainees should claim proficiency at LP. Although few would argue that the neurology residents should have been taught at some time during their residencies to complete the items on the checklist, it would also be interesting to measure their potential improvement if given the checklist just prior to being observed, to control for the effect of "teaching to the test" to the Medicine interns.

The ultimate question for many educators is not whether a dedicated hands-on teaching session can boost the pretest score of a junior resident. What we really want to know is how long this improved procedural skill will last. Barsuk and colleagues posed this same question after demonstrating the value of simulation-based mastery teaching of central line placement by internal medicine residents. At 6 and 12 months postsimulation training, more than 80% of the individual trainees (some since graduated by the time the year had passed) retained mastery level skills based on the same observation checklist used in their initial training.[6]

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The Barsuk et al. study is clearly a wake-up call for all of us who were trained in the era of "see one, do one, teach one"—the so-called "apprenticeship model" of medical training. The old training methods are no longer enough to ensure the best education, and thus the best care for patients. With recent studies indicating simulation training can improve patient safety and reduce rates of nosocomial infection, it is clear that simulation is here to stay and will play an expanding role in undergraduate and graduate medical education.[7] Medical education will continue to evolve and change over the coming years. This is not the first time, nor the last, we will hear the refrain "another one bites the dust."

## DISCLOSURE

The authors report no disclosures relevant to the manuscript. **Go to Neurology.org for full disclosures.**

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